WHAT IS CLAIMED IS:

1. A nitride compound semiconductor element comprising:

a sapphire substrate;

a first single crystalline layer of AlN formed on said sapphire substrate;

a second single crystalline layer formed on said first single crystalline layer, said second single crystalline layer being made of $Al_xGa_{1-x}N(0.8 \leqq x \leqq 0.97)$ and having a thickness of equal to or more than 0.3 μm and equal to or less than 6 μm; and

a device structure section of a nitride compound semiconductor formed on said second single crystalline layer.

2. The nitride compound semiconductor element according to claim 1, wherein said second single crystalline layer is made of $Al_xGa_{1-x}N$ $(0.85 \leqq x \leqq 0.95)$ and has a thickness of equal to or more than 0.7 μm and equal to or less than 3 μm.

3. The nitride compound semiconductor element according to claim 1, wherein said first single crystalline layer has a thickness of equal to or more than 10 nm and equal to or less than 50 nm.

4. The nitride compound semiconductor element according to claim 1, wherein said first single crystalline layer is doped with carbon having a concentration of equal to or more than 3×10^{18} cm^{-3} and equal to or less than 1×10^{20} cm^{-3}.

5. The nitride compound semiconductor element according to claim 1, wherein said sapphire substrate either has no warp or is warped concavely toward said device structure section.

6. The nitride compound semiconductor element according to claim 1, further comprising:

a single crystalline AIN protective layer formed directly on said second single crystalline layer for preventing Ga atoms from evaporating from said second single crystalline layer to thereby protect said second single crystalline layer, said AIN protective layer having a thickness of equal to or more than 1 nm and equal to or less than 10 nm.

7. The nitride compound semiconductor element according to claim 4, further comprising:

an AIN layer formed between said first single crystalline layer and said second single crystalline layer, said AIN layer containing no impurity or containing impurity having a concentration of less than 3×10^{18} cm^{-3}.

8. The nitride compound semiconductor element according to claim 1, wherein said nitride compound semiconductor element comprises a semiconductor laser and wherein said device structure section comprises:

a first conductive-type semiconductor layer;

an active layer formed on said first conductive-type semiconductor layer for emitting light by current injection; and

a second conductive-type semiconductor layer formed on said active layer.

9. The nitride compound semiconductor element according to claim 8, wherein said active layer contains a well layer made of $Ga_{1-z}In_zN(0.15 \leqq z \leqq 0.3)$.

10. The nitride compound semiconductor element according to claim 1, further comprising:

a lattice modification layer formed between said second single crystalline layer and said device structure section, said lattice modification layer being made of $Al_yGa_{1-y}N(0.25 \leqq y \leqq 0.75)$ and having a thickness of equal to or more than 0.3 μm and equal to or less than 3 μm.

11. The nitride compound semiconductor element according to claim 10, wherein said nitride semiconductor comprises an optical switch or a field effect transistor.

12. The nitride compound semiconductor element according to claim 10, wherein said device structure section has a heterojunction of an AlN layer and a GaN layer.

13. The nitride compound semiconductor element according to claim 12, wherein said nitride semiconductor comprises an optical switch.

14. A nitride compound semiconductor element comprising:

a sapphire substrate;

a first single crystalline layer of AlN formed on said sapphire substrate;

a lattice modification layer formed on said first single crystalline layer, said lattice modification layer being made of $Al_yGa_{1-y}N(0.25 \leqq y \leqq 0.75)$ and having a thickness of equal to or more than 0.3 μm and equal to or less than 3 μm; and

a device structure section of a nitride compound semiconductor formed on said lattice modification layer.

15. The nitride compound semiconductor element according to claim 14, wherein said device structure section has a heterojunction of an AlN layer and a GaN layer.

16. The nitride compound semiconductor element according to claim 14, wherein said first single crystalline layer is doped with carbon having a concentration of equal to or more than 3×10^{18} cm^{-3} and equal to or less than 1×10^{20} cm^{-3}.

17. The nitride compound semiconductor element according to claim 16, further comprising:

a second single crystalline layer of AlN formed between

said first single crystalline layer and said lattice modification layer, said second single crystalline layer having a thickness of equal to or more than 0.3 μm and equal to or less than 6 μm.

18. The nitride compound semiconductor element according to claim 14, further comprising:

a second single crystalline layer formed between said first single crystalline layer and said lattice modification layer, said second single crystalline layer consisting of $Al_xGa_{1-x}N(0.8 \leqq x \leqq 0.97)$ and having a thickness of equal to or more than 0.3 μm and equal to or less than 6 μm.

19. A nitride compound semiconductor element comprising:

a sapphire substrate;

a first single crystalline layer of AlN formed on said sapphire substrate;

a second single crystalline layer formed on said first single crystalline layer, said second single crystalline layer being made of $Al_xGa_{1-x}N(0.8 \leqq y \leqq 1)$; and

a FET device structure section formed on said second single crystalline layer, said FET device structure section having a channel layer, a source electrode electrically connected to said channel layer, a drain electrode electrically connected to said channel layer, and a gate electrode formed over a first part of said channel layer via a gate insulating film made of $Al_{1-b}In_bN(0.03 \leqq b \leqq 0.10)$.

20. The nitride compound semiconductor element according to claim 19, wherein said channel layer is made of GaN, said source electrode is formed over a second part of said channel layer via a first nitride compound semiconductor layer and said drain electrode is formed over a third part of said channel layer via a second nitride compound semiconductor layer.